412.1 DESCRIPTION

This specification contains the requirements for the removal, containment, and disposal of existing paint on steel surfaces, preparing the steel surfaces, and the field painting/repainting of steel surfaces.

412.2 MATERIALS

A. Field Painting, Bridge Repainting and Residue Containment:

1. **Water Based Biodegradable Cleaners:** Shall be as recommended by the paint manufacturer.

2. **Paint System:** Coatings, including primer, top coat and field repair coats shall be from the same supplier and, unless otherwise specified, shall be one of the systems from the approved products list for Bridge Field Paint. The Contractor shall supply the Engineer with a copy of the manufacturer's data sheets prior to painting.

3. **Paint Color**:

   Top Coat: The color shall match existing paint unless otherwise specified. When an approved green is specified, the color shall conform to Federal Standard 595B, Color No. 24325.

   When only spot painting the work affected areas, the contractor shall obtain a paint chip sample from the structure and submit the structure sample and a paint chip from the paint supplier to the Office of Bridge Design for approval.

   Prime Coat: The prime coat color shall sharply contrast with the top coat, as approved by the Engineer.

412.3 CONSTRUCTION REQUIREMENTS

A. Surface Preparation and Painting: Unless otherwise specified in the plan notes, the following requirements shall apply to Field Painting and Bridge Repainting, Class I and Class II, as identified in the plans.

1. **Solvent Cleaning:** The affected areas shall be visually inspected for contamination of oils and greases prior to removal of the existing paint. When contamination is found on any of the areas that will be painted, the affected area(s) shall be cleaned with solvent soaked rags.

2. **Surface Preparation:**

   a. New Steel to be Field Painted: When new steel is to be field painted, the steel surfaces to be painted shall be prepared in accordance with the following:

      1) Following any solvent cleaning required, surfaces to be coated shall be abrasive blast cleaned to a condition equivalent to SSPC SP-6 (Commercial Blast Cleaning).

Abrasive for blast cleaning shall be either steel shot, mineral grit or manufactured grit and shall have a gradation that provides a uniform steel surface profile. The bare steel shall be prepared to have a surface profile of 1 mil (0.0254 mm) minimum and 3 mils (0.0762 mm) maximum, prior to application of the prime coat. The surface profile obtained on the prepared surface will be verified by ASTM Specification D4417 "Standard Test Method Field Measurements of Surface Profile of Blast Cleaned Steel" Method A, B, or C. If the surface profile cannot be maintained below the maximum limit specified, the final coating thickness shall be increased to ensure that the minimum coating thickness is achieved over the entire area to be painted.

2) Fins, tears, slivers, and burred or sharp edges shall be removed by grinding and the area reblasted to provide the profile specified.

3) Blast residue shall be removed from the steel surfaces with a commercial grade vacuum cleaner equipped with a brush type cleaning tool, or by two applications of blowing with compressed air.

4) Steel surfaces shall be kept clean, dust free, dry, and shall be primed within 24 hours of abrasive blast cleaning.

b. Bridge Repainting, Class I: When Bridge Repainting, Class I is specified, the steel surfaces to be painted shall be prepared in accordance with the following:

1) Following any solvent cleaning required, all loose rust and paint shall be removed from the work affected areas by power tool cleaning. The entire surface to be painted shall be prepared to a condition equivalent to SSPC Standard SP-3 (power tool cleaning). All power tools shall be shrouded at the cleaning head and equipped with a vacuum collection system to contain the paint residue. The power tool cleaning shall not remove any base metal.

2) Contain and collect all existing paint residue in accordance with Section 412.3.B.

c. Bridge Repainting, Class II: When Bridge Repainting, Class II is specified, the steel surfaces to be painted shall be prepared in accordance with the following:

1) Following any solvent cleaning required, abrasive blast clean the steel surfaces to remove all old paint, corrosion, and mill scale. To minimize the potential for the abrasive blasting media and/or paint residue being a hazardous material, the abrasive blasting process shall utilize a thoroughly mixed blend of abrasive blasting media and Blastox (or other approved product). The Blastox shall be added in the amount of 15 percent by weight. The abrasive media used in the abrasive blasting process shall be a silica free abrasive and shall be of a type and size in which the formation of dust during the abrasive blasting process is minimized. The entire surface to be painted shall be cleaned to a condition equivalent to the SSPC Standard SP-6 (commercial blast cleaning).

2) The bare steel shall be prepared to have a surface profile of 1 mil (0.0254 mm) minimum and 3 mils (0.0762 mm) maximum prior to application of the prime coat. The surface profile obtained on the prepared surface will be verified by ASTM Specification D4417 "Standard Test Method Field Measurements of Surface Profile of Blast Cleaned Steel" Method A, B, or C. If the surface profile cannot be maintained below the maximum limit specified, the final coating thickness shall be increased to ensure that the minimum coating thickness is achieved over the entire area to be painted.

3) The cleaned areas shall be thoroughly dry before priming.

4) Do not clean a larger area than can be prepared and primed within 24 hour period. If the prepared area is not primed within the 24 hours, the area shall have the blast cleaning repeated.

5) Contain and collect all of the existing paint residue and/or abrasive blasting media according to Section 412.3 B.

3. Mixing of Paint: The paint shall be thoroughly mixed with a power mixer in accordance with the manufacturer's recommendations before being applied and the pigments shall be kept in suspension. The manufacturer's recommended pot life times shall not be exceeded.

4. Paint Application: After the specified surface preparation, the paint shall be applied according to the following requirements:

a. The coating thickness shall meet the following dry film thickness (DFT) requirements measured in mils (mm):

	DFT (mils)	DFT (mm)
Primer	2 - 3	0.0508--0.0762
Top Coat	2 - 3	0.0508--0.0762
Total System Thickness	4 - 6	0.1016--0.1524

b. Coatings shall be applied in accordance with SSPC PA1, the manufacturer's written recommendations, or the requirements as herein specified, whichever is more stringent. A copy of the manufacturer's written instructions shall be given to the Engineer prior to painting.

c. Remove all overspray, drips, spills, etc., at no cost to the Department.

d. Apply paint only when the surface to be coated is and remains at least 5° F (3° C) above the dew point. The relative humidity shall be less than 85 percent during paint application.

e. Apply paint only when the coating materials, substrate, and air temperature are between 40° F (4° C) and 90° F (32° C).

f. Do not use thinners unless absolutely necessary for paint application. Do not exceed the manufacturer's recommendations with regard to quantity and type of thinner. Use thinners only according to the manufacturer's written instructions, and under the Engineer's supervision.

g. Using a brush, stripe coat corners, sharp edges, welds, bolt heads, nuts, etc., prior to the application of the primer and top coats.

h. The Contractor shall protect pedestrian, vehicular, watercraft, or other traffic upon or underneath the structure and also all portions of the structure against damage or disfigurement by paint. When painting over waterways, the Contractor shall implement such controls as are necessary to avoid paint spills into the water or depositing paint films on the water during spraying operations.

B. Paint Residue Removal, Containment, Collection and Storage:

1. **Bridge Repainting, Class I:** The existing paint on the surfaces to be painted shall be removed by power tool cleaning, and the paint residue contained, collected, and stored according to the plan notes, Section 412.3.A.2.b, and the following requirements:

a. All paint residue shall be placed in a 55 gallon (200 L) drum after collection. The 55 gallon (200 L) drum shall be supplied by the Contractor and shall become the property of the Department. If the 55 gallon (200 L) drum is not new, it shall not have previously contained any petroleum products and must meet the EPA definition of a reusable container. All paint removal, residue collection, and temporary storage shall be performed by the Contractor. Disposal will be performed by the Department.

b. When Bridge Repainting, Class I is specified, it is anticipated that less than 220 pounds (100 kg) of paint residue will be produced. Therefore, the waste will not require sampling, testing, and disposal as a hazardous waste. The Contractor will have to collect and weigh all the paint residue to document that less than 220 pounds (100 kg) of waste material was produced. If more than 220 pounds (100 kg) of waste material is produced the Office of Bridge Design shall be contacted immediately for further instructions.

c. The Contractor shall not place materials or trash other than paint residue, rags containing solvent and/or paint residue, and blasting media in the barrels.

d. The Contractor is responsible for complying with all regulations and for taking all necessary measures and precautions to ensure worker safety for work involved with lead particles.

e. All materials and work shall be subject to inspection by the Department. The Contractor shall provide the Engineer adequate and safe access to the work area, including ladders and scaffolding, at all times.

2. Bridge Repainting, Class II: The existing paint on the work affected areas shall be removed by abrasive blast cleaning, and the paint residue contained, collected, and stored according to the plan notes, Section 412.3.A.2.c and the following requirements:

a. All paint shall be removed from the existing steel by abrasive blast cleaning unless other methods are approved by the Engineer. The Contractor shall contain, collect, and temporarily store, all paint residue and/or blasting media. The material shall be then be loaded, transported to the location specified in the plans, and unloaded by the Contractor.

b. The Contractor shall use Best Management Practices, as defined by the Environmental Protection Agency, to contain and collect all paint residue removed from the steel surfaces and all abrasives used in blast cleaning. Containment and collection of the abrasives used in blast cleaning is required, even when not mixed with paint residue.

c. When Bridge Repainting, Class II is specified, it is anticipated that more than 220 pounds (100 kg) of paint residue and/or blasting residue will be produced. Therefore, the residue material shall be sampled and tested to determine if it is a hazardous waste. When the first 55 gallon (200 L) drum is filled, the Engineer will collect a sample and immediately submit the sample to the Bridge Construction Engineer.

d. The Contractor shall submit a written Containment Plan to the Engineer at the preconstruction meeting. The Engineer will forward the proposed Containment Plan to the Office of Bridge Design for review and approval. Possible containment methods include draped collectors suspended from the structure, tarps laid on the ground below the structure (when not near a waterway or in an urban environment), complete enclosures, and shrouded power tools with vacuum containment.

e. If a draped collector is used it shall conform to the following minimum requirements:

1) The collector shall be suspended from the structure and shall extend a minimum of 10 feet (3 m) wider, in all directions, than the area in which work is underway.

2) The collector shall be positioned in a manner acceptable to the Engineer and such that no loss of blast cleaning/paint residue occurs.

3) The collector shall be emptied at least once a day and shall not remain in place overnight without being emptied.

f. Blast cleaning and other operations shall not be performed when the direction and velocity of the wind is such that residue falls outside the limits of the collector.

g. The Contractors containment plan shall outline the procedures that will be followed to empty the collector and prevent spilling of the contents.

h. Paint residue, including abrasive blasting residue, shall be placed in 55 gallon (200 L) drums after collection. The 55 gallon (200 L) drums shall be supplied by the Contractor and shall become the property of the Department. If the 55 gallon (200 L) drums are not

new, the drums shall not have previously contained petroleum products. The drums shall meet the EPA definition of a reusable container.

i. Only paint residue, blasting media, and solvent soaked rags are allowed to be placed in the containment drums. These drums shall not be used for other garbage or waste.

j. The 55 gallon (200 L) drums shall be filled, properly sealed, temporarily stored, loaded, hauled to the location specified in the plans, and unloaded by the Contractor. Temporary storage of the material on the site shall be at a location where there is no possibility of a spill entering any waterway. All costs associated with this work shall be included in the contract unit price for Paint Residue Containment.

k. Until test results are obtained to substantiate that the material is not hazardous, each 55 gallon (200 L) drum shall be marked with the words "Hazardous Waste" and shall be dated with the date on which the drum was filled. This shall be done by using a permanent and waterproof marker.

l. Disposal of the barrels containing the paint residue and blasting media will be the responsibility of the Department.

m. The Contractor is responsible for complying with all regulations and for taking all of the necessary measures to ensure worker safety for the work involving lead particles.

C. Inspection: All materials and work shall be subject to inspection by the Department. The Contractor shall provide the Engineer adequate and safe access to the work area, including ladders and scaffolding, at all times.

When Bridge Repainting, Class II is specified, the Contractor shall blast a test area of a girder web to SSPC Standard SP-6, prior to the start of the abrasive blast cleaning operations. This test area shall be full depth of the web and shall be three feet in length. Using the visual and profile standards, the Engineer will inspect the area to determine when adequate surface preparation has been achieved. After adequate surface preparation has been achieved, this area shall be preserved for reference purposes during the remainder of the abrasive blast cleaning operation. If deterioration of this area occurs due to weathering, dampness, or other conditions, a new area shall be prepared at no additional cost to the Department.

412.4 METHOD OF MEASUREMENT

Measurement for the items Field Painting, Bridge Repainting, and Paint Residue Containment will not be made.

412.5 BASIS OF PAYMENT

A. Bridge Repainting will be paid for at the contract lump sum price. Payment will be full compensation for surface preparation, furnishing and applying the coating system, repair of damaged areas, cleanup, providing inspection access, and all incidentals to satisfactorily complete the work.

B. Paint Residue Containment will be paid for at the contract lump sum price. Payment will be full compensation for all direct and incidental costs to remove, contain, and temporarily store paint residue. When specified in the plan notes, payment will be full compensation for loading the residue, transporting the residue to the location specified, and unloading the residue.

C. Field Painting will be paid for at the contract lump sum price. Payment will be full compensation for surface preparation, furnishing and applying the coating system, repair of damaged areas, cleanup, providing inspection access, and all incidentals to satisfactorily complete the work.

THIS PAGE INTENTIONALLY LEFT BLANK